

# MINERAL INDUSTRY SURVEYS

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## NICKEL IN APRIL 1997

Reported domestic nickel consumption in April, on a daily average basis, was 17% greater than that of March, according to the U.S. Geological Survey. Increases occurred in 8 of the 10 end use categories—the principal exception being alloy steel. Daily usage by the stainless steel industry was up 25% from the March average of 108 metric tons (t). Consumption of elemental nickel to make nickel-base corrosion resistant alloys increased 26%. Sales to plating companies averaged 43 t per day, 17% more than in March. Percentages reported in this paragraph may not be verifiable owing to the concealment of company proprietary data. Trade data for April will appear in a subsequent issue.

### **KWG Resources and Commercial Caribbean Nickel team up to develop the Cupey concession in eastern Cuba**

On July 10, KWG Resources Inc. and Commercial Caribbean Nickel S.A. (CCN) announced plans to jointly develop the Cupey lateritic nickel deposits in Holguín Province (Mining Journal, 1997). CCN is a parastatal enterprise of the Cuban Government responsible for several other exploration and mine development projects on the island. KWG is a Montreal-based exploration company with interests in several gold properties in Cuba, Haiti, and the Russian Far East. The company is a member of the Ste.-Geneviève Group, a consortium that includes St. Geneviève Resources Ltd., Spider Resources Inc., and five other Canadian companies.

The proposed Cupey project would produce over 30,000 t of nickel (Ni) and 1,400 t of cobalt (Co) annually for at least 25 years. The Cupey deposits reportedly contain 107 million t of lateritic and serpentine resources grading 1.32% Ni and 0.115% Co based on a cutoff grade of 1.0% Ni. Some 22 million t are proven and another 85 million t are probable. The resource

calculations were made by Geominera S.A.—a second parastatal organization that oversees the Cuban mineral industry—and were checked by an independent Canadian engineering firm (KWG Resources Inc., 1997a). Metallurgical test work on bulk samples suggests that nickel recovery would be in the range of 84% to 87%.

As part of the project, the 50/50 joint venture would complete the partially built ore processing plant at Las Camariocas. Construction ground to a halt when funding dried up after the dissolution of the U.S.S.R. The unfinished plant has been on a care and maintenance basis since 1991 and is about 75% complete. A dedicated refinery would be built in Canada to convert the concentrate from Las Camariocas into nickel metal.

Under an agreement signed on July 5, CCN would contribute the deposits and the existing processing infrastructure. The original sponsor, the defunct Council for Mutual Economic Assistance (COMECON), reportedly spent \$600 million on the complex before construction stalled. KWG would be responsible for raising the \$325 million needed to finance the project (KWG Resources Inc., 1997b). Some \$70 million would be spent to construct the refinery. The refinery would probably be located in Quebec to take advantage of the Province's inexpensive hydroelectric power.

### **References Cited**

- KWG Resources Inc., 1997a, KWG Resources Inc. signs major agreement for nickel plant in Cuba and refinery in Canada: Montreal, Canada, KWG Resources Inc. 2 p. (Accessed July 11, 1997, on the World Wide Web at URL [http://biz.yahoo.com/pnews/97/07/10/kwg\\_kwgd\\_1.html](http://biz.yahoo.com/pnews/97/07/10/kwg_kwgd_1.html))
- 1997b, Report for quarter ended June 30, 1997: Montreal, Canada, KWG Resources Inc. 8 p. (Accessed September 29, 1997, on the World Wide Web at URL <http://www.kwg.com/>)
- Mining Journal, 1997, Cuban nickel venture...Cuban nickel deal: Mining Journal, v. 329, no. 8438, July 18, p. 41-42.

TABLE 1  
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

| Period  | Cathodes,<br>pellets,<br>briquets, and<br>powder | Ferronickel | Oxide-sinter,<br>salts, and<br>other<br>forms | Total    | Total<br>year to<br>date |
|---|--|-------------|---|----------|--------------------------|
| 1996:   |  |             |   |          |                          |
| April   | 6,620  | 1,490       | 249   | 8,360    | 34,200                   |
| May   | 7,050  | 1,470       | 285   | 8,800    | 43,000                   |
| June  | 6,710  | 1,530       | 236   | 8,480    | 51,400                   |
| July  | 6,520  | 1,160       | 131   | 7,810    | 59,300                   |
| August  | 6,340  | 1,450       | 140   | 7,930    | 67,200                   |
| September                                     | 6,050  | 1,540       | 178   | 7,770    | 75,000                   |
| October                                       | 6,740  | 1,750       | 320   | 8,810    | 83,800                   |
| November                                      | 5,700  | 1,340       | 365   | 7,400    | 91,200                   |
| December                                      | 5,690  | 1,650 r/    | 181   | 7,520 r/ | 98,700                   |
| January-December                              | 78,100   | 17,600      | 2,980   | 98,700   | XX                       |
| 1997:   |  |             |   |          |                          |
| January                                       | 6,900  | 2,000       | 101   | 9,000    | 9,000                    |
| February                                      | 5,950  | 1,510       | 129   | 7,590    | 16,600                   |
| March   | 5,730 r/   | 1,580       | 253   | 7,570 r/ | 24,200 r/                |
| April:  |  |             |   |          |                          |
| Steel:  |  |             |   |          |                          |
| Stainless and heat resisting                  | 2,280  | 1,340       | W   | 3,620    | 14,600                   |
| Alloy (excludes stainless)                    | 159  | W           | W   | 159      | 2,420                    |
| Superalloys                                   | 792  | --          | W   | 792      | 2,990                    |
| Copper-nickel alloys                          | W  | W           | --  | W        | W                        |
| Electrical, magnetic, and<br>expansion alloys | W  | --          | --  | W        | W                        |
| Other nickel & nickel alloys                  | W  | W           | W   | W        | W                        |
| Cast iron                                     | W  | --          | --  | W        | W                        |
| Electroplating (sales to platers)             | 1,290  | --          | W   | 1,290    | 4,900                    |
| Chemical and chemical uses                    | W  | --          | W   | W        | W                        |
| Other uses                                    | 1,960  | 155         | 570   | 2,680    | 7,760                    |
| Total reported                                | 6,480 2/   | 1,490       | 570   | 8,540    | 32,700                   |
| Total all companies (calc) 3/                 | XX   | XX          | XX  | 12,400   | 47,600                   |
| 1997: January-April                           | 25,100   | 6,590       | 1,050   | 32,700   | XX                       |
| 1996: January-April                           | 27,300   | 5,700       | 1,140   | 34,200   | XX                       |

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Of consumption, 5,650 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (68.69%) to apparent primary consumption for 1994.

TABLE 2  
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS,  
BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

| Period  | Cathodes, pellets,<br>briquets, and<br>powder | Ferronickel | Oxide-sinter,<br>salts, and<br>other forms | Total    |
|---|---|-------------|--|----------|
| 1996:   |   |             |  |          |
| April   | 4,430   | 131         | 81   | 4,640    |
| May   | 4,080   | 343         | 92   | 4,510    |
| June  | 3,610   | 337         | 91   | 4,040    |
| July  | 3,450   | 517 r/      | 70   | 4,040    |
| August  | 3,340   | 429         | 77   | 3,850    |
| September   | 2,910   | 277 r/      | 82   | 3,270    |
| October   | 2,770   | 472 r/      | 82   | 3,320    |
| November  | 6,170   | 625 r/      | 64   | 6,860 r/ |
| December  | 4,990   | 1,540       | 78   | 6,610    |
| 1997:   |   |             |  |          |
| January   | 4,370   | 659         | 55   | 5,080    |
| February  | 3,970 r/                                      | 231         | 180  | 4,390    |
| March   | 4,020   | 240 r/      | 603 r/                                     | 4,870 r/ |
| April:  |   |             |  |          |
| Steel (stainless, heat resisting and alloy)                                 | 2,030   | (3/)        | (4/)                                       | 2,030    |
| Nonferrous alloys 5/  | 1,600   | (3/)        | (4/)                                       | 1,600    |
| Foundry (cast irons)  | 1   | --          | (4/)                                       | 1        |
| Chemical (catalysts, ceramics, plating<br>salts, etc.) and unspecified uses | 145   | --          | 998  | 1,140    |
| Total   | 3,780   | (6/)        | 998  | 4,770    |

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustment.

3/ Included in "Chemicals and unspecified uses" category of "Oxide sinter, salts, and other forms".

4/ Included in "Chemicals and unspecified uses" category

5/ Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

6/ Included in total for "Oxide sinter, salts, and other forms".

TABLE 3  
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

| Period              | Consumption         |                        |                | Stocks              |                        |                |
|---------------------|---------------------|------------------------|----------------|---------------------|------------------------|----------------|
|                     | Ferrous<br>scrap 2/ | Nonferrous<br>scrap 3/ | Total<br>scrap | Ferrous<br>scrap 2/ | Nonferrous<br>scrap 3/ | Total<br>scrap |
| 1996:               |                     |                        |                |                     |                        |                |
| April               | 3,920 r/            | 825 r/                 | 4,740 r/       | 3,770 r/            | 90                     | 3,860 r/       |
| May                 | 4,100               | 793 r/                 | 4,900 r/       | 3,130 r/            | 100                    | 3,230 r/       |
| June                | 3,780 r/            | 635 r/                 | 4,410 r/       | 3,070 r/            | 101                    | 3,170 r/       |
| July                | 3,670               | 690 r/                 | 4,360 r/       | 3,320 r/            | 97                     | 3,420 r/       |
| August              | 2,860               | 1,080 r/               | 3,940 r/       | 3,360 r/            | 98                     | 3,460 r/       |
| September           | 3,490               | 871 r/                 | 4,370 r/       | 3,100 r/            | 110                    | 3,210 r/       |
| October             | 3,600 r/            | 773 r/                 | 4,370 r/       | 3,340               | 107                    | 3,450 r/       |
| November            | 3,250               | 785 r/                 | 4,030 r/       | 3,630               | 89                     | 3,720          |
| December            | 3,320 r/            | 656 r/                 | 3,970 r/       | 3,510 r/            | 88                     | 3,600 r/       |
| January-December    | 43,400              | 9,980 r/               | 53,400 r/      | XX                  | XX                     | XX             |
| 1997:               |                     |                        |                |                     |                        |                |
| January             | 4,800               | 830 r/                 | 5,630 r/       | 3,160               | 116                    | 3,280          |
| February            | 3,880               | 791 r/                 | 4,670 r/       | 3,290 r/            | 114                    | 3,400 r/       |
| March               | 4,250               | 995 r/                 | 5,250 r/       | 4,090 r/            | 104                    | 4,190 r/       |
| April               | 5,260               | 774                    | 6,040          | 3,820               | 113                    | 3,940          |
| 1997: January-April | 18,200              | 3,390                  | 21,600         | XX                  | XX                     | XX             |
| 1996: January-April | 15,300              | 3,700                  | 19,000         | XX                  | XX                     | XX             |

r/ Revised. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

| Period and country<br>of origin | Cathodes,<br>pellets, and<br>briquets | Powder<br>and<br>flakes | Ferro-<br>nickel | Metal-<br>lurgical-<br>grade<br>oxide | Waste<br>and<br>scrap | Stainless<br>steel<br>scrap | Chemicals | Total 3/ | Total<br>year to<br>date 4/ | Wrought<br>nickel |
|---------------------------------|---------------------------------------|-------------------------|------------------|---------------------------------------|-----------------------|-----------------------------|-----------|----------|-----------------------------|-------------------|
| 1996:                           |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| March                           | 9,130                                 | 917                     | 2,130            | 39                                    | 385                   | 369                         | 241       | 13,200   | 40,400                      | 60                |
| April                           | 11,300                                | 760                     | 980              | 21                                    | 344                   | 313                         | 187       | 13,900   | 54,300                      | 52                |
| May                             | 11,000                                | 945                     | 2,020            | 91                                    | 411                   | 319                         | 219       | 15,000   | 69,400                      | 72                |
| June                            | 7,750                                 | 927                     | 1,430            | 9                                     | 343                   | 289                         | 254       | 11,000   | 80,400                      | 43                |
| July                            | 7,230                                 | 684                     | 1,470            | 18                                    | 238                   | 274                         | 216       | 10,100   | 90,500                      | 42                |
| August                          | 9,250                                 | 835                     | 1,120            | 14                                    | 235                   | 319                         | 265       | 12,000   | 103,000                     | 44                |
| September                       | 9,390                                 | 629                     | 884              | 33                                    | 416                   | 322                         | 234       | 11,900   | 114,000                     | 52                |
| October                         | 7,850                                 | 779                     | 1,050            | 60                                    | 581                   | 373                         | 311       | 11,000   | 125,000                     | 67                |
| November                        | 9,820                                 | 670                     | 1,520            | 99                                    | 328                   | 308                         | 290       | 13,000   | 138,000                     | 38                |
| December                        | 9,180                                 | 815                     | 969              | 21                                    | 351                   | 275                         | 251       | 11,900   | 150,000                     | 61                |
| January-December                | 113,000                               | 9,690                   | 16,000           | 463                                   | 4,270                 | 3,790                       | 3,270     | 150,000  | XX                          | 637               |
| 1997:                           |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| January                         | 7,640                                 | 954                     | 1,180            | 111                                   | 364                   | 263                         | 265       | 10,800   | 10,800                      | 57                |
| February                        | 9,310                                 | 945                     | 1,180            | 395                                   | 696                   | 392                         | 242       | 13,200   | 23,900                      | 53                |
| March:                          |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| Australia                       | 1,310                                 | 200                     | --               | --                                    | --                    | --                          | --        | 1,510    | 3,190                       | --                |
| Canada                          | 4,530                                 | 710                     | --               | 277                                   | 274                   | 175                         | 40        | 6,000    | 17,800                      | 2                 |
| Colombia                        | --                                    | --                      | 174              | --                                    | --                    | --                          | --        | 174      | 376                         | --                |
| Dominican Republic              | --                                    | --                      | 645              | --                                    | 8                     | --                          | --        | 653      | 2,110                       | --                |
| Finland                         | 379                                   | 137                     | --               | --                                    | --                    | --                          | 9         | 525      | 1,190                       | --                |
| France                          | 197                                   | --                      | --               | --                                    | 107                   | --                          | 15        | 319      | 739                         | 4                 |
| Germany                         | 11                                    | (5/)                    | --               | --                                    | 3                     | --                          | 18        | 33       | 180                         | 54                |
| Japan                           | --                                    | 2                       | --               | --                                    | 2                     | 4                           | 25        | 33       | 184                         | 8                 |
| New Caledonia                   | --                                    | --                      | 250              | --                                    | --                    | --                          | --        | 250      | 925                         | --                |
| Norway                          | 4,900                                 | --                      | --               | --                                    | --                    | --                          | --        | 4,900    | 7,150                       | --                |
| Russia                          | 2,930                                 | 24                      | --               | --                                    | --                    | --                          | --        | 2,960    | 6,120                       | --                |
| South Africa                    | 38                                    | --                      | --               | --                                    | --                    | --                          | --        | 38       | 158                         | --                |
| United Kingdom                  | 30                                    | 5                       | --               | --                                    | 93                    | --                          | 4         | 131      | 382                         | 1                 |
| Zimbabwe                        | 40                                    | --                      | --               | --                                    | --                    | --                          | --        | 40       | 270                         | --                |
| Other                           | 140                                   | 53                      | 3                | --                                    | 57                    | 163                         | 87        | 503      | 1,180                       | 4                 |
| Total                           | 14,500                                | 1,130                   | 1,070            | 277                                   | 544                   | 342                         | 198       | 18,100   | 42,000                      | 73                |
| 1997: January-March             | 31,400                                | 3,030                   | 3,430            | 784                                   | 1,600                 | 997                         | 704       | 42,000   | XX                          | 183               |
| 1996: January-March             | 30,100                                | 2,650                   | 4,550            | 98                                    | 1,030                 | 994                         | 1,040     | 40,400   | XX                          | 166               |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 5  
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content 2/)

| Period and country<br>of destination | Cathodes,<br>pellets, and<br>briquets | Powder<br>and<br>flakes | Ferro-<br>nickel | Metal-<br>lurgical-<br>grade<br>oxide | Waste<br>and<br>scrap | Stainless<br>steel<br>scrap | Chemicals | Total 3/ | Total<br>year to<br>date 4/ | Wrought<br>nickel |
|--------------------------------------|---------------------------------------|-------------------------|------------------|---------------------------------------|-----------------------|-----------------------------|-----------|----------|-----------------------------|-------------------|
| 1996:                                |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| March                                | 80                                    | 92                      | 181              | 271                                   | 859                   | 1,140                       | 261       | 2,880    | 8,990                       | 52                |
| April                                | 149                                   | 63                      | 119              | 134                                   | 965                   | 2,760                       | 389       | 4,570    | 13,600                      | 27                |
| May                                  | 82                                    | 171                     | 220              | 331                                   | 782                   | 1,520                       | 519       | 3,620    | 17,200                      | 31                |
| June                                 | 79                                    | 142                     | 73               | 616                                   | 800                   | 1,530                       | 295       | 3,530    | 20,700                      | 19                |
| July                                 | 7                                     | 50                      | 650              | 480                                   | 778                   | 2,650                       | 364       | 4,980    | 25,700                      | 30                |
| August                               | 44                                    | 97                      | 299              | 348                                   | 703                   | 2,200                       | 424       | 4,120    | 29,800                      | 64                |
| September                            | 6                                     | 80                      | 179              | 359                                   | 1,210                 | 2,230                       | 292       | 4,360    | 34,200                      | 27                |
| October                              | 20                                    | 79                      | 359              | 420                                   | 1,280                 | 2,270                       | 185       | 4,620    | 38,800                      | 63                |
| November                             | 19                                    | 88                      | 324              | 517                                   | 918                   | 1,610                       | 197       | 3,670    | 42,500                      | 59                |
| December                             | 21                                    | 75                      | 433              | 393                                   | 960                   | 1,850                       | 551       | 4,280    | 46,800                      | 21                |
| January-December                     | 586                                   | 1,060                   | 3,330            | 4,210                                 | 10,900                | 22,800                      | 3,940     | 46,800   | XX                          | 439               |
| 1997:                                |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| January                              | 20                                    | 72                      | 442              | 513                                   | 862                   | 1,740                       | 455       | 4,100    | 4,100                       | 56                |
| February                             | 39                                    | 114                     | 416              | 134                                   | 1,000                 | 1,690                       | 515       | 3,920    | 8,020                       | 89                |
| March:                               |                                       |                         |                  |                                       |                       |                             |           |          |                             |                   |
| Australia                            | --                                    | --                      | --               | --                                    | 19                    | --                          | --        | 19       | 56                          | 1                 |
| Belgium                              | 1                                     | 3                       | --               | --                                    | --                    | --                          | --        | 4        | 106                         | (5/)              |
| Canada                               | 23                                    | 35                      | --               | 171                                   | 709                   | 145                         | 40        | 1,120    | 3,250                       | 2                 |
| Germany                              | 2                                     | 5                       | --               | (5/)                                  | 40                    | --                          | 45        | 92       | 218                         | 4                 |
| India                                | --                                    | 1                       | --               | --                                    | --                    | 1                           | --        | 2        | 476                         | 1                 |
| Italy                                | --                                    | (5/)                    | --               | --                                    | --                    | 1                           | 29        | 30       | 32                          | 2                 |
| Japan                                | --                                    | 5                       | 62               | --                                    | 96                    | 62                          | 181       | 406      | 1,260                       | --                |
| Korea, Republic of                   | --                                    | 10                      | --               | (5/)                                  | --                    | 645                         | 6         | 661      | 1,710                       | 23                |
| Mexico                               | --                                    | 3                       | 12               | --                                    | --                    | 2                           | 41        | 58       | 347                         | 12                |
| Netherlands                          | --                                    | 12                      | --               | --                                    | --                    | 3                           | --        | 15       | 48                          | --                |
| Spain                                | --                                    | 3                       | --               | --                                    | --                    | --                          | --        | 3        | 1,060                       | --                |
| Sweden                               | --                                    | 5                       | --               | --                                    | 310                   | 2                           | --        | 317      | 767                         | --                |
| Taiwan                               | --                                    | (5/)                    | 419              | --                                    | (5/)                  | 307                         | 9         | 735      | 1,230                       | --                |
| United Kingdom                       | --                                    | 3                       | 4                | --                                    | --                    | 17                          | (5/)      | 24       | 96                          | 6                 |
| Other                                | --                                    | 8                       | 119              | 1                                     | 37                    | 92                          | 137       | 394      | 1,250                       | 9                 |
| Total                                | 26                                    | 93                      | 616              | 172                                   | 1,210                 | 1,280                       | 488       | 3,880    | 11,900                      | 60                |
| 1997: January-March                  | 85                                    | 280                     | 1,470            | 820                                   | 3,080                 | 4,710                       | 1,460     | 11,900   | XX                          | 206               |
| 1996: January-March                  | 158                                   | 214                     | 670              | 611                                   | 2,480                 | 4,140                       | 723       | 8,990    | XX                          | 97                |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

| Period and country<br>of origin | Unwrought<br>alloyed<br>ingot | Bars, rods,<br>and<br>profiles | Wire  | Plates<br>and<br>sheets | Foil | Tubes<br>and<br>pipes | Other<br>alloyed<br>articles | Total  | Total<br>year to<br>date 2/ |
|---------------------------------|-------------------------------|--------------------------------|-------|-------------------------|------|-----------------------|------------------------------|--------|-----------------------------|
| 1996:                           |                               |                                |       |                         |      |                       |                              |        |                             |
| March                           | 300                           | 176                            | 151   | 123                     | (3/) | 107                   | 58                           | 916    | 2,360                       |
| April                           | 561                           | 180                            | 158   | 132                     | (3/) | 95                    | 20                           | 1,150  | 3,500                       |
| May                             | 178                           | 249                            | 175   | 170                     | (3/) | 67                    | 18                           | 856    | 4,360                       |
| June                            | 221                           | 242                            | 116   | 157                     | (3/) | 71                    | 54                           | 861    | 5,220                       |
| July                            | 188                           | 117                            | 195   | 90                      | (3/) | 44                    | 107                          | 743    | 5,960                       |
| August                          | 91                            | 219                            | 97    | 187                     | (3/) | 49                    | 615                          | 1,260  | 7,220                       |
| September                       | 117                           | 70                             | 144   | 133                     | (3/) | 50                    | 59                           | 573    | 7,800                       |
| October                         | 249                           | 151                            | 120   | 90                      | (3/) | 72                    | 60                           | 741    | 8,540                       |
| November                        | 349                           | 161                            | 168   | 81                      | (3/) | 66                    | 29                           | 854    | 9,390                       |
| December                        | 151                           | 178                            | 256   | 145                     | (3/) | 48                    | 64                           | 843    | 10,200                      |
| January-December                | 2,780                         | 2,110                          | 1,810 | 1,520                   | 2    | 832                   | 1,190                        | 10,200 | XX                          |
| 1997:                           |                               |                                |       |                         |      |                       |                              |        |                             |
| January                         | 208                           | 132                            | 196   | 98                      | --   | 100                   | 108                          | 841    | 841                         |
| February                        | 181                           | 202                            | 190   | 149                     | --   | 96                    | 107                          | 926    | 1,770                       |
| March:                          |                               |                                |       |                         |      |                       |                              |        |                             |
| Australia                       | 153                           | --                             | --    | --                      | --   | --                    | --                           | 153    | 353                         |
| Belgium                         | 11                            | --                             | --    | --                      | --   | (3/)                  | --                           | 11     | 44                          |
| Canada                          | 18                            | (3/)                           | 11    | --                      | --   | 13                    | 2                            | 44     | 120                         |
| France                          | --                            | --                             | 91    | 10                      | --   | (3/)                  | (3/)                         | 101    | 263                         |
| Germany                         | 2                             | 33                             | 65    | 76                      | --   | 1                     | 1                            | 178    | 617                         |
| Italy                           | --                            | 60                             | 4     | --                      | --   | 14                    | (3/)                         | 78     | 199                         |
| Japan                           | 8                             | --                             | 4     | 2                       | --   | 16                    | (3/)                         | 30     | 82                          |
| Mexico                          | (3/)                          | --                             | --    | --                      | --   | --                    | (3/)                         | (3/)   | 1                           |
| Netherlands                     | --                            | --                             | --    | --                      | --   | --                    | (3/)                         | (3/)   | 18                          |
| South Africa                    | 38                            | --                             | --    | --                      | --   | --                    | --                           | 38     | 103                         |
| Sweden                          | --                            | --                             | 86    | 2                       | --   | 68                    | --                           | 156    | 396                         |
| United Kingdom                  | 34                            | 91                             | 3     | --                      | (3/) | 4                     | 14                           | 146    | 373                         |
| Other                           | --                            | --                             | 3     | 1                       | --   | 1                     | 35                           | 39     | 171                         |
| Total                           | 264                           | 184                            | 266   | 91                      | (3/) | 117                   | 52                           | 974    | 2,740                       |
| 1997: January-March             | 653                           | 518                            | 652   | 338                     | (3/) | 313                   | 267                          | 2,740  | XX                          |
| 1996: January-March             | 674                           | 541                            | 379   | 331                     | (3/) | 270                   | 162                          | 2,360  | XX                          |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 7  
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight )

| Period and country<br>of destination | Unwrought<br>alloyed<br>ingot | Bars, rods,<br>and<br>profiles | Wire  | Plates<br>and<br>sheets | Foil | Tubes<br>and<br>pipes | Other<br>alloyed<br>articles | Total 2/ | Total<br>year to<br>date 2/ |
|--------------------------------------|-------------------------------|--------------------------------|-------|-------------------------|------|-----------------------|------------------------------|----------|-----------------------------|
| 1996:                                |                               |                                |       |                         |      |                       |                              |          |                             |
| March                                | 331                           | 308                            | 121   | 631                     | 20   | 100                   | 170                          | 1,680    | 5,710                       |
| April                                | 651                           | 337                            | 138   | 441                     | 43   | 149                   | 648                          | 2,410    | 8,110                       |
| May                                  | 508                           | 219                            | 149   | 792                     | 7    | 89                    | 242                          | 2,010    | 10,100                      |
| June                                 | 531                           | 270                            | 155   | 676                     | 60   | 81                    | 168                          | 1,940    | 12,100                      |
| July                                 | 335                           | 349                            | 148   | 628                     | 8    | 84                    | 451                          | 2,000    | 14,100                      |
| August                               | 540                           | 184                            | 176   | 619                     | 5    | 96                    | 183                          | 1,800    | 15,900                      |
| September                            | 274                           | 177                            | 166   | 622                     | 9    | 78                    | 176                          | 1,500    | 17,400                      |
| October                              | 602                           | 240                            | 147   | 600                     | 12   | 49                    | 394                          | 2,040    | 19,400                      |
| November                             | 485                           | 340                            | 113   | 725                     | 5    | 74                    | 276                          | 2,020    | 21,400                      |
| December                             | 478                           | 191                            | 119   | 971                     | 9    | 146                   | 129                          | 2,040    | 23,500                      |
| January-December                     | 5,710                         | 3,210                          | 1,560 | 8,000                   | 200  | 1,270                 | 3,520                        | 23,500   | XX                          |
| 1997:                                |                               |                                |       |                         |      |                       |                              |          |                             |
| January                              | 541                           | 320                            | 115   | 838                     | 10   | 91                    | 120                          | 2,040    | 2,040                       |
| February                             | 641                           | 222                            | 137   | 554                     | 20   | 136                   | 180                          | 1,890    | 3,930                       |
| March:                               |                               |                                |       |                         |      |                       |                              |          |                             |
| Australia                            | --                            | 1                              | (3/)  | 63                      | --   | 2                     | 1                            | 67       | 194                         |
| Belgium                              | --                            | --                             | --    | 2                       | --   | --                    | 20                           | 22       | 51                          |
| Canada                               | 93                            | 23                             | 26    | 26                      | 9    | 33                    | 44                           | 254      | 1,150                       |
| France                               | 147                           | 69                             | (3/)  | 3                       | --   | --                    | 19                           | 238      | 799                         |
| Germany                              | (3/)                          | 24                             | 4     | 14                      | (3/) | (3/)                  | --                           | 42       | 188                         |
| India                                | --                            | --                             | --    | --                      | --   | --                    | (3/)                         | (3/)     | (3/)                        |
| Ireland                              | --                            | (3/)                           | 24    | 2                       | --   | --                    | 1                            | 27       | 55                          |
| Italy                                | 1                             | 1                              | 3     | 132                     | --   | 2                     | (3/)                         | 139      | 336                         |
| Japan                                | 62                            | 7                              | 2     | 160                     | --   | (3/)                  | 47                           | 278      | 668                         |
| Korea, Republic of                   | 13                            | 8                              | --    | 104                     | --   | 1                     | 2                            | 128      | 330                         |
| Mexico                               | 2                             | 2                              | 34    | 3                       | (3/) | 6                     | 19                           | 66       | 137                         |
| Netherlands                          | 6                             | 18                             | 8     | 8                       | --   | --                    | (3/)                         | 40       | 110                         |
| Singapore                            | (3/)                          | 15                             | 15    | 1                       | --   | 1                     | 2                            | 34       | 75                          |
| Spain                                | --                            | (3/)                           | (3/)  | 40                      | --   | (3/)                  | --                           | 40       | 61                          |
| Sweden                               | 3                             | (3/)                           | --    | 14                      | 13   | 1                     | --                           | 31       | 65                          |
| Switzerland                          | (3/)                          | 5                              | 1     | 2                       | --   | 1                     | (3/)                         | 9        | 41                          |
| Taiwan                               | (3/)                          | 1                              | (3/)  | --                      | --   | 1                     | 24                           | 26       | 109                         |
| United Kingdom                       | 74                            | 129                            | 28    | 269                     | (3/) | 40                    | 5                            | 545      | 1,290                       |
| Other                                | 24                            | 31                             | 7     | 5                       | 1    | 11                    | 413                          | 492      | 750                         |
| Total                                | 425                           | 334                            | 152   | 848                     | 23   | 99                    | 597                          | 2,480    | 6,410                       |
| 1997: January-March                  | 1,610                         | 876                            | 404   | 2,240                   | 53   | 326                   | 897                          | 6,410    | XX                          |
| 1996: January-March                  | 1,310                         | 906                            | 250   | 1,930                   | 41   | 423                   | 852                          | 5,710    | XX                          |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ May include revisions for prior months.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 8  
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

|                                     | Percent |      |
|-------------------------------------|---------|------|
|                                     | Wrought | Cast |
| April 1997:                         |         |      |
| Stainless and heat resisting steels | 98      | 2    |
| Alloy steels                        | 99      | 1    |
| Superalloys                         | 74      | 26   |
| Copper-nickel alloys                | 98      | 2    |
| Other nickel-base alloys            | 100     | (1/) |

1/ Less than 1/2 unit.

TABLE 9  
NICKEL PRICES

| Date                  | Cathode<br>NY Dealer<br>\$/lb. | LME<br>Cash<br>\$/t | LME<br>Cash<br>\$/lb. | 18/8 Stainless<br>steel scrap<br>Pittsburgh<br>\$/long ton(gw) |
|-----------------------|--------------------------------|---------------------|-----------------------|--|
| Average for month of: |                                |                     |                       |  |
| 1997:                 |                                |                     |                       |  |
| March                 | 3.647                          | 7,895.868           | 3.582                 | 900  |
| April                 | 3.399                          | 7,315.523           | 3.318                 | 894 r/   |
| May                   | 3.482                          | 7,482.850           | 3.394                 | 855  |
| For week ending:      |                                |                     |                       |  |
| 1997:                 |                                |                     |                       |  |
| March 7               | 3.72-3.81                      | 8,065.900           | 3.659                 | 890-910  |
| March 14              | 3.69-3.79                      | 7,943.300           | 3.603                 | 890-910  |
| March 21              | 3.66-3.77                      | 7,882.100           | 3.575                 | 890-910  |
| March 28              | 3.54-3.68                      | 7,641.250           | 3.466                 | 890-910  |
| April 4               | 3.55-3.58                      | 7,593.875           | 3.445                 | 890-910  |
| April 11              | 3.39-3.54                      | 7,237.400           | 3.283                 | 880-905 r/   |
| April 18              | 3.30-3.42                      | 7,203.200           | 3.267                 | 880-905 r/   |
| April 25              | 3.39-3.48                      | 7,305.600           | 3.314                 | 880-905 r/   |
| May 2                 | 3.39-3.43                      | 7,261.500           | 3.294                 | 880-905  |
| May 9                 | 3.42-3.56                      | 7,504.750           | 3.404                 | 840-850  |
| May 16                | 3.59-3.65                      | 7,677.100           | 3.482                 | 840-850  |
| May 23                | 3.54-3.67                      | 7,571.300           | 3.434                 | 840-850  |
| May 30                | 3.40-3.51                      | 7,230.875           | 3.280                 | 840-850  |

r/ Revised.

Sources: Platt's Metals Week and American Metal Market.